



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,550	09/02/2003	Ioana Stanoi	728-238(YOR920030357US1)	3501

28249 7590 03/31/2006  
DILWORTH & BARRESE, LLP  
333 EARLE OVINGTON BLVD.  
UNIONDALE, NY 11553

EXAMINER

LIN, SHEW FEN

ART UNIT PAPER NUMBER

2166

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/653,550	STANOI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shew-Fen Lin	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

- a. This action is responsive to application filed on 9/2/2003.
- b. Claims 1-18 are pending. Claims 1, 5, 9, and 14 are independent claims.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-5 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation of "pruning said plurality of hints to avoid unnecessary navigation when processing said query" recited in claim 1 is not supported in the specification. Instead, the specification discloses that "hint" is used to prune large sections out of query processing, as stated in page 7, paragraph 4, lines 5-7, "In this case, during the traversal, negative hints h(1, 2, e), and h(3, 7, e) were accessed and helped prune out the traversal.", page 8, paragraph 5, lines 3-4, "The goal is to prune large sections of the XML document out of the traversal.". The discrepancy needs to be resolved.

The limitation of "having a tag t" in claim 3 is indefinite. If tag t is the tag to be visited, eliminating the child c of node n having a tag t from query processing is lack of utility. Claim 4 is rejected on the same basis.

Art Unit: 2166

The limitation of “the usefulness of the hint is calculated as  $Usf_{h(l, c, t)} = (1 + \alpha * \text{sem} W_{h(l, c, t)}) * Usf_{h(l, c, t)}$ ” in claim 5 is indefinite because  $Usf_{h(l, c, t)}$  is not defined.

The limitation of “wherein said structural usefulness of a hint is a number of nodes...” in claim 7 is rejected because “a hint” is an indefinite term.

### ***Claim Rejections – 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 5-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

#### **MPEP 2106 IV. B.2. (b)**

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. Schrader, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below), or (B) be limited to a practical application within the technological arts.

Claims 5-18, in view of the above-cited MPEP section, are not statutory because they merely recite steps that can be performed by a person with pen and paper. The use of a computer or a data processor has not been indicated being used to perform the steps. The language of the claim raises a question as to whether the claim is directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application

Art Unit: 2166

producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101 nor is there a transformation of something physical to another state or thing.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Linden et al. (US Publish 2005/0050011, hereinafter referred as Linden) in view of Min et al. (US Publish 2004/0098384, hereinafter referred as Min).

As to claim 1, Linden discloses a method for processing queries of hierarchical tagged data using hints (column 1, paragraph [0006], lines 1-9), said hints being navigational aids (hint is utilized to navigate the hierarchical node during query, column 1, paragraph [0006], lines 9-10) and said processing being performed on a computing device, providing a plurality of hints for the hierarchical tagged data, said data having a plurality of nodes l and c such that l is a parent of c (in a hierarchical node tree including hint in the child pointer, column 1, paragraph [0007]); pruning said plurality of hints to avoid unnecessary navigation when processing said queries (use hint to determine whether to navigate to the corresponding child node, Figures 9-10, column 4, paragraph [0054]); updating said hints in accordance with required navigation workload and updates and changes to the hierarchical tagged data (updating tree/pointer, column 2, paragraph [0023], paragraph [0028]); and selecting techniques for hints according to limitations on an allocated memory size of said computing device (page buffer manager to manage record/page, in-memory pointer update, column 2, paragraph [0025], paragraph [0026]).

Linden discloses the elements of claim 1 as noted above but does not explicitly disclose updating said hints in accordance with required navigation workload.

Min discloses updating query path using workload information and update are repeatedly performed whenever the workload is changed (Figure 1, column 2, paragraph [0036]).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Linden's disclosure to update hint based on workload as taught by Min for the purpose of dynamic adjusting information with workload (column 1, paragraph [0011], Min).

Art Unit: 2166

The skilled artisan would have been motivated to improve the invention of Linden per the above such that hint/index can support dynamic workload more efficiently (column 1, paragraph [0006], lines 13-16, Min).

**As to claim 2**, Linden discloses wherein the hint being represented as  $h(l, c, t)$ , where  $t$  is a tag of a child node accessible in top-down traversal from  $c$ , said hint being positive if  $t$  exists and otherwise negative (the hint contains information: parent, child, and query information, column 5, paragraph [0065], lines 7-16).

**As to claim 3**, Linden discloses further comprising the steps of: matching hint information at a currently accessed node  $n$  with a remaining query path  $q$  (receive query and check hint, Figure 10, column 4, para [0055]); analyzing all hints where  $c$  is a child of node  $n$  (for every child, compare hint with query, Figure 10, paragraph [0055]); and eliminating from query processing a sub tree rooted at each child  $c$  of node  $n$  having a tag  $t$  (skip the child's sub-tree that hint does not match the query, Figure 10, paragraph [0056]).

**As to claim 4**, Linden discloses further comprising the steps of: a) for every query path  $q$ , identifying all children  $c$  of a current node  $n$  having a tag  $t$  to be visited in a next step of query processing (identify child node, Figure 10, para [0055]); b) for each tag  $t$  to match in said query path  $q$ , determining all hints such that  $c$  is a child of  $n$  (check each child pointer with hint, Figure 10, paragraph [0055]); c) eliminating from query all said children  $c$  of said current node  $n$  having said tag  $t$  to be visited in said next step of query processing (skip the child's sub-tree that hint does not match the query, Figure 10, paragraph [0056]); d) determining a query constraints and

Art Unit: 2166

further reducing said children c having said tag t to be visited in said next step of query processing in accordance with said constraints; e) for each said child c having said tag t, setting sub queries q' corresponding to a sub tree rooted at said child c having said tag t (navigate the next node in step 1018, Figure 10, paragraph [0057]), and f) repeating steps (a) through (e) (repeat step 1006-1018 until the node tree has been traversed, Figure 10, paragraph [0057]).

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangwon Park and Hyoun-Joo Kim ("A New Query Processing Technique for XML Based on Signature", Proceedings of the 7<sup>th</sup> International Conference on Database Systems for Advanced Application, 2001, hereinafter referred as Park) in view of Chakraborty et al. (US Patent 6,542,911, hereinafter referred as Chakraborty).

**As to claim 5**, Park discloses a method of utilizing one or more hints (hint is used to prune unnecessary sub-trees, abstract) for query processing over a hierarchical tagged data structure (query a tree structure of XML, abstract) in a computing system having memory, the data structure having a plurality of nodes l and c such that l is a parent of c (parent, child, sibling nodes, page 2, section 3, 1<sup>st</sup> paragraph), the hint, represented as  $h(l, c, t)$ , being positive if there is a tag t accessible in top-down traversal from c and otherwise negative (hint is positive if ANDing hint and tag is equal to tag, and via versa, page 3, section 4, 2<sup>nd</sup> paragraph), said method comprising steps of: for each tag in the XML document calculating each hint and a usefulness of each hint (calculate signature hint for each node and use LRU for the usefulness measurement, page 2, Figure 2, page 3, Table 1, section 4, 2<sup>nd</sup> paragraph); selecting a number of hints k having



Art Unit: 2166

a greatest usefulness, where  $k$  equals a total memory size divided by a size of the hint; and eliminating redundant hints (cache and buffer manager use the LRU replacement algorithm to optimize number of hint, page 6, section 6, 1<sup>st</sup> paragraph).

Park discloses the elements of claim 5 as noted above but does not explicitly disclose selecting a number of hints  $k$  having a greatest usefulness, where  $k$  equals a total memory size divided by a size of the hint.

Chakraborty discloses scanning the node table to determine the least recently used node in the table. Then the algorithm removes that node and repeats the process until the XML tree is smaller than the threshold (Figure 2, column 3, lines 26-31).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Park's disclosure to limit number of hints based on available memory as taught by Chakraborty for the purpose of storing the most frequently used hints in the memory (column 3, lines 1-7, Chakraborty). The skilled artisan would have been motivated to improve the invention of Park per the above such that most frequently used path hints is available.

**As to claim 8**, Park discloses wherein only negative hints are used (hint is negative if ANDing hint and tag is not equal to tag, and is used to decide not to visit the sub-tree, page 3, section 4, 2<sup>nd</sup> paragraph).

Art Unit: 2166

Claims 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park, in view of Bob McGregor ("Practical C++", Que Publisher, August 11, 1999, hereinafter referred as McGregor).

**As to claims 9 and 14**, Park discloses a system with methods /means / system of utilizing one or more hints (hint is used to prune unnecessary sub-trees, abstract) for query processing over a hierarchical tagged data structure (query a tree structure of XML, abstract) in a computing system having memory, the data structure having a plurality of nodes (parent, child, sibling nodes, page 2, section 3, 1<sup>st</sup> paragraph ), the hint being positive if there is a tag t accessible in top-down traversal from a child node and otherwise negative (hint is positive if ANDing hint and tag is equal to tag, and via versa, page 3, section 4, 2<sup>nd</sup> paragraph ), said method comprising steps of: for each tag in the data structure: (a) calculating a bitmap for a current node B(current) with all bits set to one (set bitmap to 0, page 2, Figure 2, page 3, Table 1, section 4, 2<sup>nd</sup> paragraph ); (b) setting a bit of a current tag B(current)[tag(current-tag)] to zero (set bitmap to the current tag, page 3, section 4, 1<sup>st</sup> paragraph); (c) calculating a plurality of possible non-redundant hints for each child node (calculate signature hint for each child, page 3, section 4, 1<sup>st</sup> paragraph); and (d) refreshing a hint list (updating hint on deletion and insertion operation, page 6, section 6, 2<sup>nd</sup> paragraph).

Park discloses the elements of claim 9 as noted above but using inverse bitmap.

McGregor discloses, basing De Morgan's Law, " the expression  $p||q$  and  $!(p\&\&!q)$  are synonymous", where  $||$  is OR operation and  $\&\&$  is AND operation (Page 2).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Park's disclosure to reverse the bitmap in step (a) from 0 to 1 and using ANDing instead of ORing as taught by McGregor to get the same hint information. The skilled artisan would have been motivated to improve the invention of Park per the above such that hint can be used to reduce the number of nodes to be visited.

**As to claims 10 and 15**, Park discloses wherein step (a) further comprises the steps of: calculating a bitmap for each child node of said current node (calculate signature hint for each child, page 3, section 4, 1<sup>st</sup> paragraph); AND-ing all said bitmaps for each child node (OR-ing bitmaps for child node, page 3, section 4, 1<sup>st</sup> paragraph); and setting a bit corresponding to tag ID  $B(\text{current})[\text{tagid}(\text{current-tag})]$  of a current tag to zero if said current tag exists (set bit to 1 if tag exists, page 3, section 4, 1<sup>st</sup> paragraph).

Park discloses the elements of claims 9 and 10 as noted above but using inverse bitmap.

McGregor discloses, basing De Morgan's Law, "the expression  $p||q$  and  $!(p\&\&!q)$  are synonymous", where  $||$  is OR operation and  $\&\&$  is AND operation (Page 2).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Park's disclosure to reverse the bitmap in step (a) from 0 to 1 and using ANDing instead of ORing as taught by McGregor to get the same hint information. The skilled artisan would have been motivated to improve the invention of Park per the above such that hint can be used to reduce the number of nodes to be visited.

Art Unit: 2166

**As to claims 11 and 16**, Park discloses wherein step (c) further comprises the steps of:  
for each bit  $j$  such that  $B(\text{current})[j]$  is equal to zero and  $B(\text{child})[j]$  is equal to one: (c1)  
determining if there is a need to add a hint  $h(\text{current node}, \text{current child}, \text{tag}(j))$  to a list of hints;  
(c2) eliminating a least useful hint from said list if said list is full; and (c3) adding said hint to  
said list (LRU replacement algorithm is used and the least recently used node is replaced, page 6,  
section 6, 1<sup>st</sup> paragraph).

**As to claims 12 and 17**, Park discloses wherein step (c1) further comprises the step of  
determining if a usefulness value  $\text{Usf}[h(\text{current node}, \text{current child}, \text{tag}(j))]$  of said hint is greater  
than the least useful hint in said list (usefulness is based on the LRU algorithm, i.e. time stamp  
for the last used, page 6, section 6, 1<sup>st</sup> paragraph).

**As to claims 13 and 18**, Park discloses wherein only negative hints are used (hint is  
negative if ANDing hint and tag is not equal to tag, and is used to decide not to visit the sub-tree,  
page 3, section 4, 2<sup>nd</sup> paragraph).

***Allowable Subject Matter***

Claims 6-7 are objected to as being dependent upon a rejected base claim (claim 5), but  
would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C 112, 2<sup>nd</sup> paragraph

Art Unit: 2166

and 101 issues, set forth in this Office Action and to include all of the limitations of the base claim and any intervening claims.

### ***Related Prior Arts***

The following list of prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Sangwon Park, Yoonra Choi, and Hyoung-Joo Kim, "XML Query Processing Using Signature and DTD", Proceedings of the 3rd International Conference, EC-Web2002, Aix-en-Provence, France, Sep. 2-6, 2002, Proceedings, volume 2455 of Lecture Notes in Computer Science. Springer, 2002.
- Pavel Zezula, Giuseppe Amato, Franca Debole and Fausto Rabitti, "Tree Signatures for XML Querying and Navigation", ACM, 3/12/2003.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shew-Fen Lin whose telephone number is 571-272-2672. The examiner can normally be reached on 8:30AM - 5:00PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on 571-272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2166

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 2166  
March 22, 2006

Shew-Fen Lin  
Patent Examiner

  
MOHAMMAD ALI  
PRIMARY EXAMINER